

ABSTRACT OF THE DISCLOSURE

A photonic crystal-based resonant cavity includes a first dielectric substance having a first dielectric permittivity, a plurality of second dielectric substances having a second dielectric permittivity and arranged in a first periodic structure with respect to at least one or more directions on a plane formed of the first dielectric substance, a plurality of third dielectric substances having a third dielectric permittivity and arranged in a second periodic structure with respect to at least one or more directions on the plane formed of the first dielectric substance, and disposed in unit cells formed by the plurality of second dielectric substances so as to be arranged in a third periodic structure together with the plurality of second dielectric substances, and one or more local defects formed to disrupt either the first periodic structure formed by the second dielectric substances or the second periodic structure formed by the third dielectric substances.